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Foundations of Programming: Python

Assignment 05

CD Inventory Script – Modified

# Introduction

The purpose of this week’s assignment was to improve the functionality of the CD Inventory program from last week by modifying the 2D table data structure with dictionaries as the inner structure and a list as the outer data structure while also adding the functionality of loading existing data and of deleting an entry of said data.

# Dictionaries

While at first, I was having a hard time understanding the benefits of dictionaries to lists, as I progressed through this week’s assignment, I realized the benefits. Since dictionaries allow access by only it’s key, then it seems to be much more efficient and effective for the lookup of elements in said data structure. On the other hand, with lists, you need to know what index the value you are trying to find is located. This gets even more complicated when trying to delete elements of a list as then the indices change, while with a dictionary the key is immutable.

# Loading data

My first step in loading the data was to check whether the file existed because while I was initially testing my script, I found that it would throw an error when trying to load from a file that did not exist yet. I decided to use a boolean flag for my test and it there was a file with the file name CDInventory.txt in the directory then it would load the data, and if there was not a file then it would alert the user that they no file existed and that they needed to add some CD entries. If the user did add CDs and save them to a file or if the file did already exist, then I created a for/in loop telling the computer to loop through each row of the data file, stripping the commas from the data, and to store this data in a dictionary with the keys: ‘id’, ‘title’, and ‘artist’. The script then appends the data to the list of dictionaries for further presentation and processing.

Text

Description automatically generated

Figure 1 - Script checking if file exists, loading the data if it does, and throwing a error message if it doesn't.

# Deleting data

I struggled with adding the deleting functionality but not on what I would expect. In a separate test file, I wrote a script that would do the deleting that I wanted to however when I imported it in to my CDInventory.py, I could not figure out why it was not working at all. I finally discovered that when I was loading the data from the txt file, I was storing the ID as a string and not an integer and so when the user input an integer that they wanted to delete, it was ignoring my for/in loop as shown in Figure 2.

Text

Description automatically generated

Figure 2 - Script showing the for/in loop finding the dictionary that the user wants to delete from user’s integer input.

Once I was able to figure out that simple fix, I decided to add a functionality of overriding the old file data with the new data that has just been edited otherwise, I realized that if the user went on to the save option, it would just append this newly edited/deleted data to the exiting file and the deleted entry would still be in the file. Therefore, I opened the file in ‘w’ mode to accomplish this as shown in Figure 3.

Text

Description automatically generated

Figure 3 - Script showing the overwriting file functionality to avoid duplicate data.

# Execution of script

I executed the script in both Spyder and a python terminal window as shown in below in the following pages.

# *Running in Spyder*Graphical user interface, text, application Description automatically generatedTable Description automatically generatedTable Description automatically generatedTable Description automatically generated with medium confidenceText, letter Description automatically generated

# *Running in python terminal window*

Text

Description automatically generated

Text

Description automatically generated

# *CD Inventory text file*

Graphical user interface, application

Description automatically generated

Figure 4 - Screenshot of text file after adding CDs and deleting entry #2.

# Github

My Github address is located at this [website](https://github.com/dfredin/Assignment_05) (external reference).[[1]](#footnote-1)

# Summary

While on the surface, this week’s assignment of changing the inner data structure from lists to dictionaries and adding the functionality of loading existing data while being able to delete an entry seemed straight forward however, I found that adding additional functionality created a headache of different problems for my script. One functionality that I unfortunately did not have enough time to conquer was the ability to check in the existing data in the file whether a user added CD entry already existed before allowing them to add it and to save it to the file. I also found that upon testing of my script that if the user did not enter an integer for the ID, then my program would throw a ValueError and the program would crash. I could not figure out a solution to this in my allotted time this week.

# Appendix

Using [saravji’s website](https://www.saravjishut.org/syntax) (external reference)[[2]](#footnote-2) to properly highlight my source code for CDInventory.py.

|  |  |
| --- | --- |
| 1  2  3  4  5  6  7  8  9  10  11  12  13  14  15  16  17  18  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  54  55  56  57  58  59  60  61  62  63  64  65  66  67  68  69  70  71  72  73  74  75  76  77  78  79  80  81  82  83  84  85  86  87  88  89  90  91  92  93  94  95  96  97  98  99  100  101  102  103  104  105  106  107 | *#-------------------------------------------#*  *# Title: CDInventory.py*  *# Desc: Starter Script for Assignment 05*  *# Change Log: (Who, When, What)*  *# DBiesinger, 2030-Jan-01, Created File*  *# Dfredin, 2022-Nov-11, Modified file to use dictionaries and loading/deleting functionality*  *#-------------------------------------------#*  *# Declare variables*  menuChoice = '' *# User input*  intInput = int() *#User input for deletion*  lstTbl = [] *# list of lists to hold data*  dicRow = {} *# dictionary of data row*  strFileName = 'CDInventory.txt' *# data storage file*  objFile = **None** *# file object*  flag = bool()  **import** **os.path**  *# ---------- PRESENTATION (I/O) ----------- #*  print('The Magic CD Inventory**\n**')  **while** **True**:  *# 1. Display menu allowing the user to choose:*  print('[l] Load Inventory from file**\n**[a] Add CD**\n**[i] Display Current Inventory')  print('[d] Delete CD from Inventory**\n**[s] Save Inventory to file**\n**[x] Exit')  menuChoice = input('l, a, i, d, s or x: ').lower() *# convert choice to lower case at time of input*  print()  **if** menuChoice == 'x':  **break** *# 5. Exit the program if the user chooses to*  *# -------------- PROCESSING --------------- #*  **if** menuChoice == 'l':  flag = os.path.isfile(strFileName) *# Testing to see if file exists*  **if** flag:  lstTbl.clear() *# Clears the table so as to not duplicate data before loading*  objFile = open(strFileName, 'r')  **for** row **in** objFile:  lstRow = row.strip().split(',')  dicRow = {'id': int(lstRow[0]), 'title': lstRow[1], 'artist': lstRow[2]}  lstTbl.append(dicRow)  objFile.close()  **else**:  print('The file does not exist. Add CDs first.**\n**')  *# ---------- PRESENTATION (I/O) ----------- #*  **elif** menuChoice == 'a':  *# 2. Add data to the table (2d-list) each time the user wants to add data*  *# TODO Wanted to add a check to see if added CD is already in inventory before duplicating*  strID = input('Enter an ID: ')  strTitle = input('Enter the CD**\'**s Title: ')  strArtist = input('Enter the Artist**\'**s Name: ')  intID = int(strID)  *# TODO Want to add an error message when user inputs anything but an Integer*  dicRow = {'id': intID, 'title': strTitle, 'artist': strArtist}  lstTbl.append(dicRow)  **elif** menuChoice == 'i':  *# 3. Display the current data to the user each time the user wants to display the data*  **if** len(lstTbl) == 0: *# Checks if the list of dicts is empty before*  print('Please load the Inventory from file before displaying!**\n**') *# If empty then asks to load*  **else**:  print('========CD INVENTORY========') *# If data has been loaded, then displays it*  print('ID, CD Title, Artist')  **for** row **in** lstTbl:  print(\*row.values(), sep = ', ')  print() *# Leaves an empty line after displaying Inventory*  *# -------------- PROCESSING --------------- #*  **elif** menuChoice == 'd':  **if** len(lstTbl) == 0: *# Checks if the list of dicts is empty before*  print('Please load the Inventory from file before deleting!**\n**') *# If empty then asks to load*  **else**:  print('====CURRENT CD INVENTORY====') *# Gives current inventory for user to choose from to delete*  print('ID, CD Title, Artist')  **for** row **in** lstTbl:  print(\*row.values(), sep = ', ')  print()  intInput = int(input('What ID would you like to delete? ')) *# Takes user input for deletion*  **for** i **in** range(len(lstTbl)):  **if** lstTbl[i]['id'] == intInput:  print('You have deleted the following CD: **\n**',  str(lstTbl[i]['id']),',',  str(lstTbl[i]['title']),',',  str(lstTbl[i]['artist']))  print()  **del** lstTbl[i] *# Deletes the entry the user chooses*  **break**  objFile = open(strFileName, 'w') *# Writes new inventory into new file, overwriting old file*  **for** row **in** lstTbl:  strRow = ''  **for** item **in** row.values():  strRow += str(item) + ','  strRow = strRow[:-1] + '**\n**'  objFile.write(strRow)  objFile.close()  lstTbl.clear() *# Clears table to user doesn't continue added same CD to inventory*  *# -------------- PROCESSING --------------- #*  **elif** menuChoice == 's':  *# 4. Save the data to a text file CDInventory.txt if the user chooses so*  **if** len(lstTbl) == 0: *# Checks if the list of dicts is empty before*  print('Please add to the Inventory before saving!**\n**') *# If empty then asks to load*  **else**:  objFile = open(strFileName, 'a')  **for** row **in** lstTbl:  strRow = ''  **for** item **in** row.values():  strRow += str(item) + ','  strRow = strRow[:-1] + '**\n**'  objFile.write(strRow)  objFile.close()  lstTbl.clear() *# Clears table to user doesn't continue added same CD to inventory*  **else**:  print('Please choose either l, a, i, d, s or x!**\n**')  print('Good bye!') *# Exit statement* |

1. Retrieved 13 Nov 2022 (https://github.com/dfredin/Assignment\_05) [↑](#footnote-ref-1)
2. Retrieved 13 Nov 2022 [↑](#footnote-ref-2)